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An ocean-going marine fish hatchery outfitted for general scientific research — that was the . . .

Fisheries Research Steamer *Fish Hawk*

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The U.S. Commission of Fish and Fisheries recognized the need for coastal vessels to conduct surveys, explorations and scientific research on marine resources from its beginning by a joint resolution of Congress on February 9, 1871. In 1879 Congress appropriated $45,000 for a vessel and the Commission decided on a coastal steamer designed by C. W. Copeland of the Light House Board. It was planned primarily as a floating hatchery and was to be named the *Fish Hawk*.

Until 1880 the Navy Department had furnished steamers for the Commission's summer work every year except 1872 and 1876. The first detail was a small steam launch in 1871. In 1873, 1874, and 1875 the 100-ton steamer *Blue Light* and in 1877, 1878 and 1879 the 306-ton steamer *Speedwell* provided excellent facilities for coastal surveys.

A FLOATING HATCHERY

The *Fish Hawk*, a coal burning twin-screw steamer, was 157 feet long with 484 tons displacement (Figure 1). The fore and aft two-masted schooner was commissioned in the spring of 1880 and the Navy Department provided officers and crew under the command of Lieut. Z. L. Tanner. She was outfitted as a hatchery for shad, striped bass, mackerel and herring and also for general scientific research with a hoisting winch with 1,000 fathoms of steel cable (Figure 2) for trawling and dredging and a variety of other equipment for sounding, obtaining sea bottom temperatures and collecting marine organisms.

The hull below the main deck was of iron sheathed with yellow pine, about 3-inches thick, caulked and coppered. Above the main deck the structure was wood. She had a promenade deck extending from stem to stern and from side to side on which

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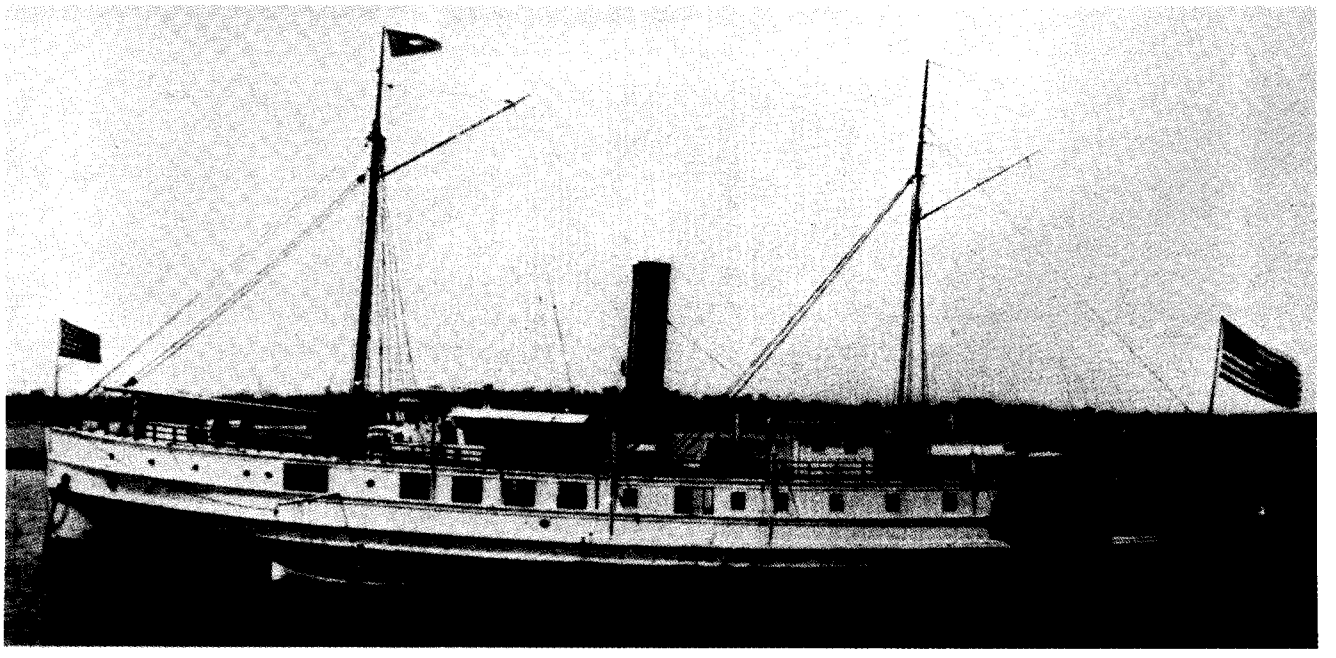
Figure 1.—The fisheries steamer *Fish Hawk*.



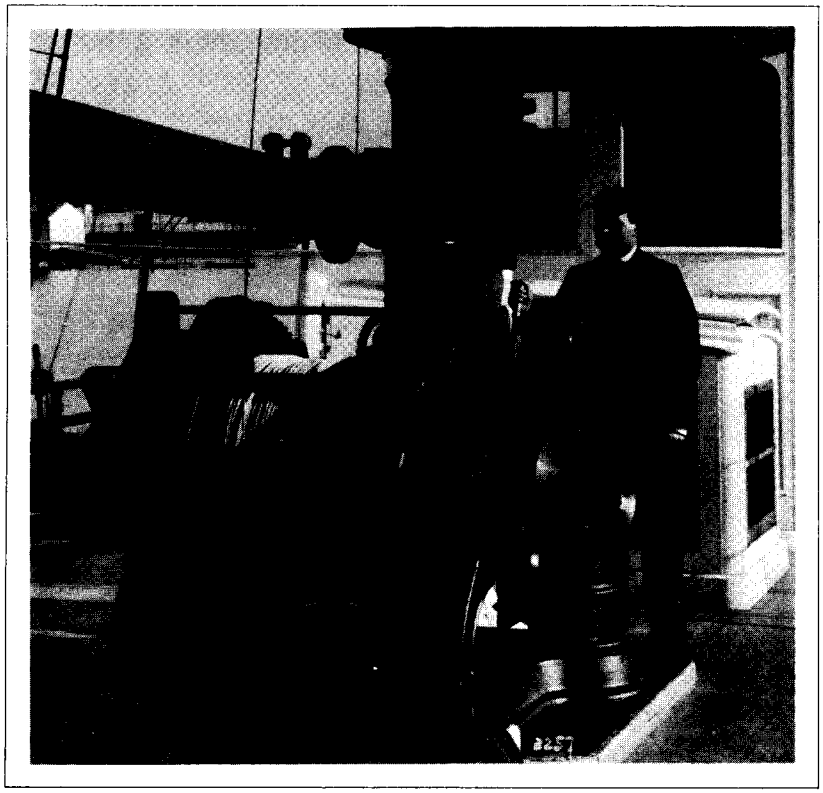


Figure 2.—Hoisting winch with 1,000 fathoms of steel cable.

Figure 3.—Main deck showing some of the hatching cones and the two 500-gallon distribution tanks.

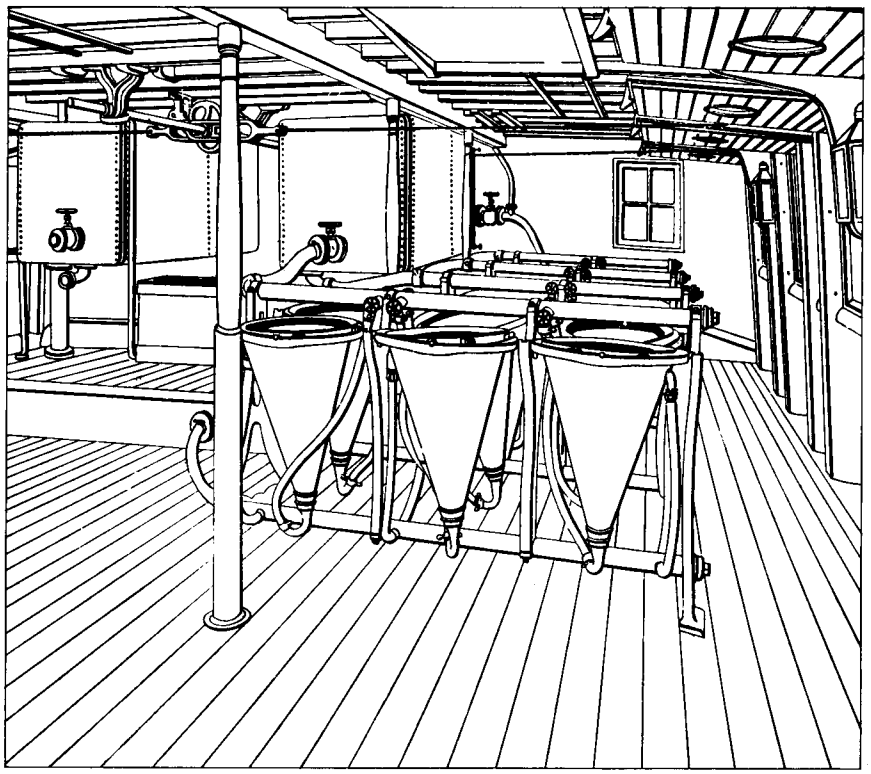
was located the pilot house, captain's quarters and laboratory.

In 1870, most fishery scientists believed that spawning success was the most significant factor in the productivity of fisheries. American shad was one of the more important fisheries of the United States and their propagation had the highest priority. To successfully propagate shad, hatcheries would have to be built on every major river from Florida to Massachusetts. Because shad runs last only a month or less at any locality, the concept of a floating hatchery that could move along the coast was considered practical.

HATCHING EQUIPMENT

The main deck was filled with hatching equipment (Figure 3). This equipment consisted of a pump supplying 10,000 gallons per hour, two distribution tanks of 500 gallons each, 36 hatching cones, each capable of hatching 200,000 shad eggs, and 18 hatching cylinders, which were suspended nine on each side from beams outside the vessel (Figure 4). Fertilized eggs were placed in each cone and the current was regulated by feed valves to keep them gently in motion so they would not mat or settle to the bottom. The hatching cylinders with wire gauze bottoms were suspended, partially submerged, over the side and cam machinery gave them a gentle ascent and a more rapid descent of about 8 inches causing the eggs to rise from the bottom and circulate freely. Each cylinder held about 250,000 eggs.

The trawling, dredging and collecting gear consisted of an otter trawl and three beam trawls, 9, 11 and 17 feet, Blake and Chester rake dredges and a tangle bar (Figures 5 and 6). The tangle bar was an iron axle and wheels with deck swabs or bundles of rope yarn on chains that were



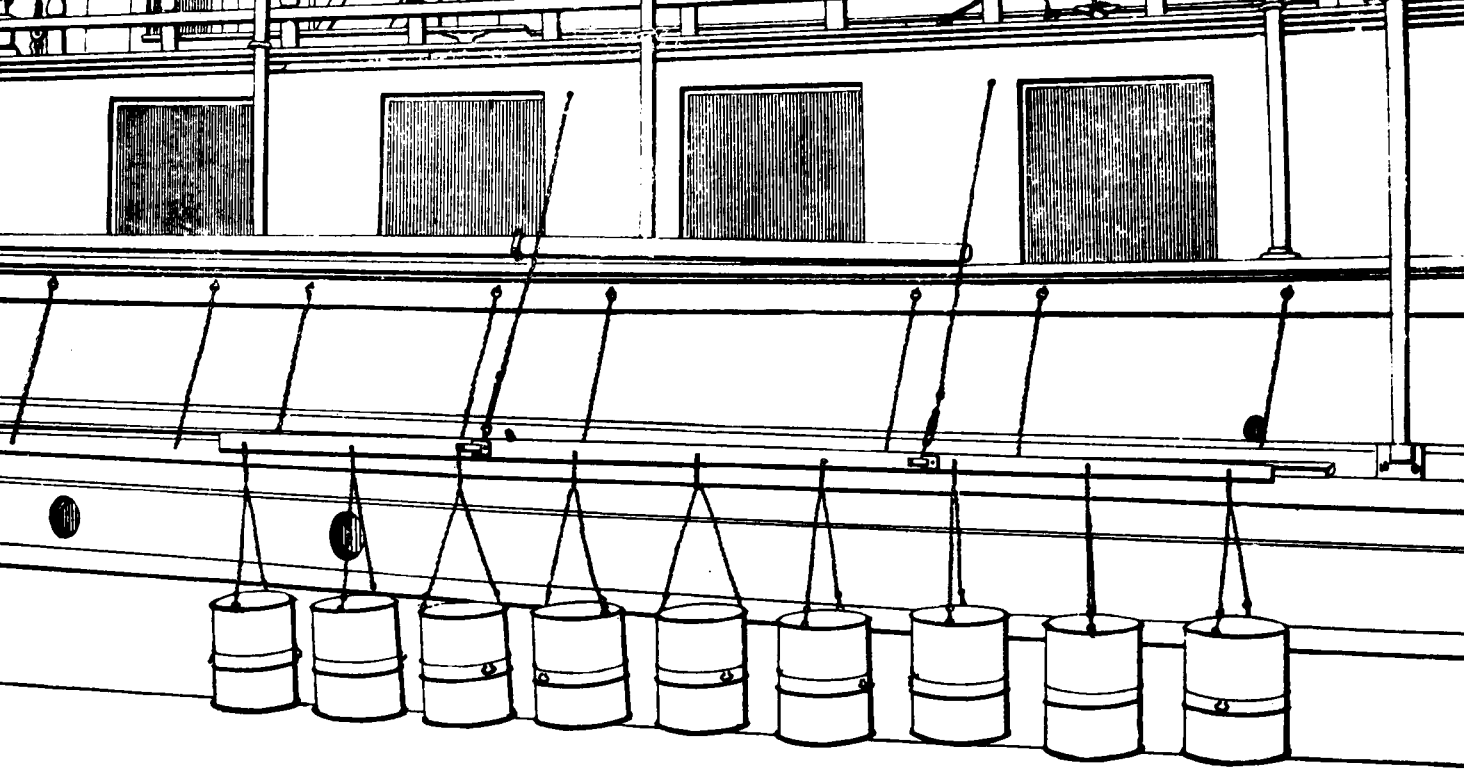


Figure 4.—Hatching cylinders suspended over the *Fish Hawk's* port side.

dragged along the rocky bottom to capture marine organisms.

Hydrographic equipment consisted of a sounding machine with 600 fathoms of piano wire, deep-sea reversing thermometers and density salinometers.

TILEFISH DISCOVERY

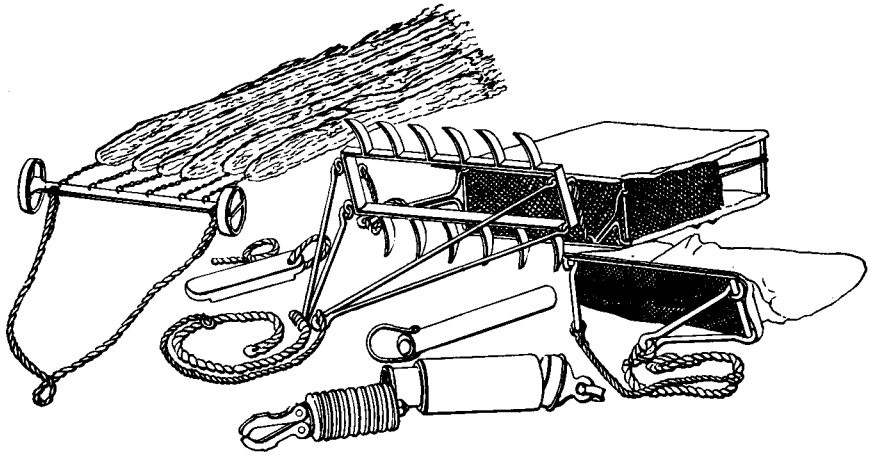
The *Fish Hawk* was designed as a hatchery ship capable of going nearshore in bays and estuaries and was not considered too suitable for offshore oceanic research. However, during her 46 years of active service she trawled and dredged out to the edge of the Continental Shelf from Maine to Florida, in the Gulf of Mexico, and off Puerto Rico. The objectives of trawling and dredging were to explore for potential fishery resources and to collect organisms for more information about the identity and life history of marine animals and plants.

The *Fish Hawk* began her long career with the auspicious and publicized discovery of the tilefish along the edge of the Continental Shelf. It all started when a commercial fisherman, Captain Kirby, brought some strange fish to the Fish Commission's station at Gloucester, Mass., in 1879. It was a new fish, new to science and new to the fishing industry. The *Fish Hawk* was called upon to explore the possibilities of this new resource. Four trips were made to the edge of the Shelf in 1880 and 40 new species of molluscs and 20 new species of fishes were obtained but the most important observations in this offshore region were those made on the tilefish.

The known range of this valuable fish was greatly extended and its existence in fishable quantities was established. The *Fish Hawk* made nine trips in 1881 and tilefish were found along the edge of the Shelf as far south as Delaware and in numbers equal to cod on the northern banks.

In 1882 a catastrophe overtook the promising tilefish resource only 3 years after its discovery. The first news of the disaster came in March. By the end of April scores of vessels had reported sighting dead tilefish for an estimated total of a billion and a half dead fish. The destruction of the tilefish was so nearly complete that fishing trials carried off southern New

Figure 5.—Assorted collecting equipment including Blake and Chester rake dredges, dredge weights, water bottle, and tangle bar.



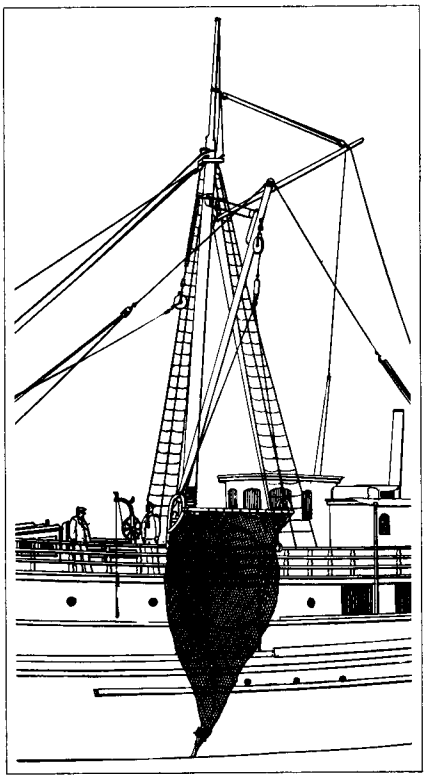


Figure 6.—11-foot beam trawl ready for lowering.

England by the Fish Commission later in 1882, 1883, 1884, 1885, 1886 and 1887 did not yield a single fish. In 1884 the search was especially diligent and thorough.

But the species was not quite extinct. The *Grampus* caught eight off Martha's Vineyard in 1892 and 53 in 1893. By 1915 tilefish were numerous enough so the Bureau of Fisheries undertook to publicize its abundance and to encourage market acceptance. Landings exceeded 10 million pounds in 1916 but the market demand did not continue. Since then landings have ranged from several hundred thousand to 2 million pounds annually.

From 1880 to 1898, the *Fish Hawk* served as a hatchery for shad every spring and during other times of the year for oyster, lobster, mackerel and several other fishes. In 1898 the usual fish cultural assignment was taken up in North Carolina and in the Delaware River until May 4 when, by order of the President, she was turned over to the Navy Department for several months service in the Mosquito Fleet during the Spanish-American War.

The *Fish Hawk* was the principal fishery vessel for the commission and its successor, the Bureau of Fisheries, along the Atlantic and Gulf coasts until 1926. Her activities were extremely varied, for besides serving as a hatchery, she conducted surveys of oyster, sponge and fishing grounds, and she transported materials and supplies for the construction and maintenance of fishery stations. Expositions were relatively popular at the turn of the century and the *Fish Hawk* was open to public display at many of them. Some of the larger ones were the Tampa Fishing Congress (1897-1898), Charleston Exposition (1902) and Jamestown Exposition (1907).

An excerpt from the Commissioner's Report for 1900 describes a typical year:

> Steamer *Fish Hawk:* During July and August this vessel was employed in making collections of marine fauna off the southern coast of New England in connection with the biological work of the station at Woods Hole, Mass., and in September she was sent to Beaufort, N.C., to assist in the topographic and hydrographic surveys incident to an inquiry into the cause of the failure of the various attempts at oyster culture which had been made in the State. At first the work was carried out in the vicinity of Beaufort and Morehead City, but in December the *Fish Hawk* proceeded to Pamlico Sound, where Swanquarter and other productive oystergrounds were examined. On March 25 the vessel was detached from this duty in order to prepare for taking up the customary shad work in the Delaware River. Some time was spent in making necessary repairs at Baltimore and on April 25 she reached her usual anchorage off Gloucester City, N.J., where shad hatching was successfully carried on until the middle of June, when she was ordered to proceed to Woods Hole.

The value of marine fish culture was questioned by a growing number of scientists by 1910. Propagation success of many freshwater fishes could be measured by the increased productivity of lakes and ponds but marine fishery production naturally fluctuated so broadly that no measure could be relied on. Skepticism originated in Europe but soon Americans voiced similar doubts that the artificial fertilization of eggs and the release of fry contributed significantly to marine fish populations. In 1912, when the *Fish Hawk* underwent a major overhaul, the hatchery cones, cylinders and other hatchery equipment were removed. From 1912 until she was condemned and sold in June 1, 1926, she conducted biological and fishery surveys in Chesapeake Bay, off the Carolinas, in Long Island Sound and in the Gulf of Maine. For a short time in 1918, during World War I, she was on military duty with the Navy's auxiliary fleet.

SUMMARY

The *Fish Hawk* had a long and commendable service with the Fish Commission and the Bureau of Fisheries. During this entire period she was manned by officers and men of the U.S. Navy. She started her career with the oceanic explorations for tilefish along the edge of the Continental Shelf. She approached the mid-point of her service with a survey of the fishery resources of Puerto Rico and during her final years conducted surveys along the Atlantic coast from Maine to Florida. For nearly a half a century she symbolized Federal fisheries research to fishermen and other coastal residents along the Atlantic seaboard.

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